Planning for a Multidisciplinary Science and Education Center -- DeepIce *

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NSF support for the Center for Particle Astrophysics will end in 1999. LBNL researchers in both the Physics and Nuclear Science Division have had fruitful interactions within the Center, and its seminar is as successful now as when CfPA was first started. In the competition for a new generation of NSF centers, the proposal for a multidisciplinary center called DeepIce that I will lead has survived two cuts from 430 initial proposals to the 16 finalists. These are now undergoing site visits, out of which 8 to 10 winners will emerge. Support for a 10-year period will begin around November 1, 1999. NSF encourages participation of national laboratories such as LBNL in the new centers.

The science components of DeepIce that will involve LBNL participants include:

1. High-energy neutrino astrophysics (Buford Price, Bob Stokstad, Dave Nygren, Willi Chinowsky, George Smoot, and their collaborators and students). Researchers in the Nuclear Science and Physics divisions have been developing a 40-module string of digital optical modules to be deployed in deep ice in December 1999.
2. Large seismic array (Lane Johnson, Tom McEvilly). Researchers in the Earth Sciences Division have been designing components of the array, which will be buried deep in the Antarctic ice and will extend 150 km in orthogonal directions along X and Y and about 2.4 km along Z at the intersection of the two arms. A student of mine, Ryan Bay, has shown that the sensitivity of a hydrophone is far greater when both it and an emitting source are at depths much greater than are any seismic stations currently in Antarctica.
3. Paleoclimatology, glaciology, geochemistry, and cosmogenic nuclides (Don DePaolo, Kuni Nishiizumi, Tony Hansen).
4. 4. Education (Bernard Sadoulet, Maria Isaac, Carl Pennypacker, Harry Reed). Through NERSC, LBNL will serve as a central repository for the hundreds of gigabytes of data to be sent by satellite every year.
5. The motto of the Center -- *ad terram et universum per glaciem* -- shows the connection between its research goals and the means of carrying them out.